with a hydrocarbon feed to yield the earlier referred to suspension of catalyst particles and hydrocarbon product vapours at the down stream part of the reactor riser.

The reactor vessel (26) further comprises means to discharge the hydrocarbon and stripping medium vapours from the vessel via conduit (34). Typically the gas outlet conduit(s) (35) of the secondary cyclone(s) (36) are in fluid connection with a plenum (37) from which the hydrocarbon product vapours are discharged via conduit (34). In a preferred embodiment an opening (38) is present in the gas outlet conduit connecting the primary cyclone with the secondary cyclone (36). Through this opening stripping medium and hydrocarbons, which are stripped from the catalyst, can be discharged from the vessel (26).

In Figure 3 a vertical arranged tubular vessel (101) is shown consisting of the primary cyclone (102) as the upper part and the stripping zone (103) as the lower part. The primary cyclone (102) has a tangentially arranged inlet (104) for receiving the suspension of catalysts and vapour. This inlet is in fluid communication with a downstream part of an externally positioned FCC reactor riser (105), allowing catalyst and vapour leaving the reactor riser (105) to enter the primary cyclone (102). The tubular housing of primary cyclone (102) has an opening (106) at its lower end and a cover (107) at its upper end. The cover (107) is provided with an opening (108). This opening (108) is fluidly connected with conduit (109) through which cleaned vapours can be discharged from the cyclone housing. The gas inlet opening (110) of conduit (109) is located at about the same level as the opening (108) in cover (107). It has been found to be advantageous that the inlet opening of conduit (109) is located at some distance (d1) above the centre of the tangentially arranged inlet

opening (104). The ratio of this distance (d1) and the diameter of the tubular housing (d2) is as described above. It is even more preferred that the gas inlet (110) of conduit (9) is formed by the opening (108) in cover (107) as shown in Figure 3. This is advantageous because the tubular cyclone housing will include less surface on which carbon deposits can accumulate. In the primary cyclone (102) the separation takes place between the major part of the catalysts and the gaseous hydrocarbons. The catalyst falls down via the open lower end (106) of the primary cyclone into a stripping zone (103).

The conduit connecting tangentially arranged inlet (104) and the riser (105) is preferably made at an angle of 90° with respect to the riser (105). However in order to eliminate accumulation of catalyst in this horizontal connecting conduit it is advantageous to direct this conduit downwards such that the gas-particles mixtures enters the primary cyclone in a downward direction. Preferably the angle between the axis of this conduit and the axis of the tubular housing (101) is between 89 and 75°. It has also been found to be advantageous to have a smaller cross sectional area at inlet (104) relative to the cross sectional area of the connecting conduit at a point nearer to the riser (105).

Preferably a vortex stabiliser (111) is provided at the interface between the primary cyclone (102) and the stripping zone (103). The vortex stabiliser (111) is suitably a circular flat plate or cone-shaped disk. The diameter of the vortex stabiliser suitably is greater than the diameter (d3) of the gas inlet opening (110) of the gas outlet conduit (109). The diameter of the vortex stabiliser (111) should be small enough to provide an annulus between the perimeter of the vortex stabiliser and the wall of the tubular housing, which annulus

permits catalysts to flow downwards while simultaneously passing stripping gas in an upwards direction. Preferably the diameter of the vortex stabiliser (111) is between 40 and 85% of the diameter (d2) of the tubular vessel (101). The vortex stabiliser (111) is preferably positioned at a distance (d4) below the gas inlet opening (110) of gas outlet conduit (109), wherein (d4) is between 2 and 5 times the diameter (d2) of the tubular vessel (101).

The vortex stabiliser (111) is preferably provided further with a vortex finder (112). A vortex finder (112) is a vertical positioned rod having a length of about between 0.25 to 1 times the diameter (d3) of the gas inlet opening of the gas outlet conduit (109). A suitable vortex stabiliser (111) and vortex stabiliser rod (112) are for example described in the above mentioned US-A-4455220. The vortex finder rod (112) may suitably be a hollow tube resulting in a fluid connection of the space above the vortex finder (111) and the space below the vortex finder (111). The hollow vortex finder rod will allow upwards moving gas to pass, thereby enhancing the stabilising effect on the vortex present in the primary cyclone (102).

In stripping zone (103) a fluidized bed (113) is present in which catalyst are stripped from the hydrocarbon deposits by supplying stripping gas via stripping gas supply means (114). Stripping gas is suitably steam. The stripping zone may suitably have more than one stripping gas supply means located at some distance above each other. The stripping zone includes a dense phase, in which the catalyst are kept in a dense fluidized bed mode by means of the stripping gas and a dilute phase located above the dense phase. The boundary between the two phases is formed by fluidized bed level (115). Through conduit (116) stripped catalyst are transported to a catalyst regenerator (not shown).